Executive Summary

The purpose of this report is to document the data, methods and assumptions used by staff of the South Florida Water Management District (SFWMD) to develop minimum flow and level (MFL) technical criteria for Lake Istokpoga. Florida law requires that water management districts develop a priority list and schedule for the establishment of MFLs for surface waters and aquifers within their jurisdiction (Section 373.042 (1), Florida Statutes) (see **Appendix A**). This list is included in the *District Water Management Plan* for the SFWMD (SFWMD 2003a). The 2004 update to this list identified the need to develop an MFL for Lake Istokpoga by 2005.

The Lake Istokpoga watershed is located in Highlands County and the lake is currently managed to prevent flooding of surrounding lands, to maintain levels sufficient to provide recreational access, maintain fish and wildlife habitats and as a source of water supply for agricultural areas to the south in Glades County. Prior to development, most of the area around Lake Istokpoga was characterized by nearly level, poorly drained flatwoods and the land south of Lake Istokpoga once contained an extensive marsh and swamp. Today, drainage ditches and water supply canals cut across historic flow ways, accelerating runoff to the lake and diverting water from parts of the watershed, lake and surrounding lands to the Kissimmee River and Lake Okeechobee. Water is withdrawn from canals and groundwater wells to support large citrus groves situated on the Lake Wales Ridge, ornamental landscape and truck crop farms on former wetlands located south of Lake Istokpoga and cattle farms on the Indian Prairie. These water supply, structural and land use changes were considered during MFL criteria development.

Section 373.042 (1) F.S. (**Appendix A**) defines the *minimum level* as the "…limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area…" For purposes of establishing minimum levels, SFWMD Rule 40E-8.021 defines *significant harm* as the "…temporary loss of water resource functions that result from a change in surface or groundwater hydrology, that takes more than two years to recover, but which is considered less severe than serious harm…" (**Appendix A**). Water resource functions protected under Chapter 373 are broad and include flood control, water quality protection, water supply and storage, fish and wildlife protection, navigation and recreation. Water management districts may also consider any changes and/or structural alterations that have occurred within the watershed and develop a recovery and prevention strategy for water bodies that do not, or are not expected to, meet the proposed criteria during the planning horizon.

Establishing *minimum* flows and levels alone will not be sufficient to maintain a sustainable resource over the broad range of water conditions that occurs within the managed system. For Lake Istokpoga, water level stabilization has caused a wide range of impacts to the resource by greatly reducing historic patterns of drying and flooding that occurred every few years. Setting a minimum level is viewed as a starting point to define water needs for protection against *significant harm*. While this report documents

many of the water resource issues associated with Lake Istokpoga, technical criteria development focuses on the establishment of minimum levels.

Pursuant to the requirements contained within Chapter 373 of the Florida Water Resources Act, water resource functions are identified and technical relationships of these functions to water flow and lake stage are described based on the best available information. This information includes results of: 1) a literature review; 2) an analysis and synthesis of present and historical stage data for Lake Istokpoga; and 3) the incorporation of data, results and conclusions from previous and ongoing investigations.

Proposed minimum water level criteria for Lake Istokpoga are linked to the concept of protecting valued ecological components from *significant harm*. A significant harm condition for Lake Istokpoga is based primarily on impacts to the lake's biological resources that last more than two years. The specific valued ecosystem components that have been identified are the remaining wetland communities that fringe the lake shore (submerged and emergent aquatic vegetation, marshes and swamps) and fishery resources. As a result of examination of available technical information, field studies and monitoring data collected before and after the 2001 drawdown for environmental enhancement, the SFWMD staff proposes the following MFL Criteria for Lake Istokpoga:

> A MFL violation occurs within Lake Istokpoga when surface water levels fall below 36.5 feet NGVD for 20 or more weeks, more often than once every four years.

The MFL criteria are intended to address low water levels that occur due to regional drought conditions and/or withdrawals of water from the lake or adjacent aquifers. Currently the lake receives an adequate supply of fresh water and water levels are controlled by a fixed regulation schedule. Since a more comprehensive management program for lake levels was instituted in 1988, water levels have remained above 37.0 feet National Geodetic Vertical Datum (NGVD), except during a managed drawdown as part of an environmental enhancement project. It is unlikely that a violation of the MFL will occur under the current operational schedule, except during controlled lake enhancement and drawdown projects. Establishment of an MFL for Lake Istokpoga may be useful as a guide to manage the frequency and magnitude of such planned drawdown events. However, it is recognized that under certain circumstances, it may be necessary to conduct a controlled drawdown of lake levels of a duration or return frequency that may exceed those outlined in the proposed criteria.

An adaptive management strategy for Lake Istokpoga recognizes the proposed MFL criteria are based on best available information with the understanding that more information is needed to refine assumptions used in criteria development. Ongoing and proposed research and monitoring efforts in the Lake Istokpoga watershed will continue to provide more information that will improve our understanding of Lake Istokpoga's resources. This information will provide SFWMD staff with an opportunity to reevaluate the proposed criteria and refine the MFL in accordance with development and implementation of the Kissimmee Basin Water Supply Plan.

The MFL criteria developed in this document should be used as the basis for SFWMD rule development and to issue consumptive use permits, both individually and cumulatively, within the Kissimmee Basin Planning Area. It is recommended that the current research and monitoring efforts by the SFWMD and the Florida Fish and Wildlife Conservation Commission, both individually and jointly, should continue since they will provide useful data for refinement of the MFL and other lake management criteria. Monitoring programs associated with drawdown and ecological enhancement projects should consider a more enhanced focus on wetland monitoring consistent with the needs of gauging *significant harm* to these resources.